

Case study

CHP system helps Polish meat processing plant save money and lower emissions

The Opportunity

Sokolow S.A. is a leader in the Polish meat industry and sports some of the most recognized trade names in the marketplace. Headquartered in the town of Sokolow Podlaski, the company has seven production facilities located throughout Poland, as well as offices in Warsaw. Sokolow is a wholly owned subsidiary of Danish Crown, one of Europe's largest meat processing companies whose products reach the farthest corners of the world.

For years, Sokolow has been a pacesetter in establishing new standards in the meat processing industry. All production complies with International Food Standard (IFS) and British Retail Consortium (BRC) standards, and all Sokolow's plants are ISO 14001 certified, verifying compliance with the highest environmental requirements.

Sokolow recently consulted with Energotechnika, a recognized leader in power/heat services, to assist in maximizing energy optimization at its facility in Sokolow Podlaski. Based in Warsaw, Poland, Energotechnika has helped modernize more than 140 production installations over the years.

Sokolow's management planned to install a combined heat and power (CHP) unit in this specific facility. Such CHP plants are typically based on gas engines whereby the waste heat from the exhaust produced during the electric generation process is captured in a heat recovery steam boiler.

Together with the heat from the engine cooling, these by products are then used for heating, cooling and, in this instance, industrial processes.

The Solution

Based on input from Energotechnika and Sokolow's engineering staff, and after consultation with Siemens Energy CHP experts, Sokolow's management decided to purchase and install a co-generation system consisting of two Siemens SGE-42HM (Guascor® HGM420) generators. Newly released to the marketplace, these units run on natural gas, each producing 1MWe of electric power. Also,

the complete plant produces 8 bar of 1.2 tons per hour of saturated steam and 100 m³/h of hot water to assist with the factory's production processes. Additional steam is produced in gas boilers equipped with an exhaust condensing system which makes the overall system highly efficient.

The Miller cycle, high-efficiency Siemens SGE-HM lean burn engine represents a unique concept in engine design with advanced technology incorporated into the cylinder heads, valves, camshafts, and turbochargers. The engine components make this series one of the most efficient, robust engines available for power generation, as well as co- and tri-generation applications. The SGE-HM engine is available as a stand-alone power unit, as part of a co-generation system on a skid, packaged as a gen-set, or containerized (noise insulated if required). These engines can be powered by a wide variety of fuels including natural gas, biogas from anaerobic digestion of organic matter, methane from landfill sites and sewage plants, and most any type of gas derived from bio-digestion processes.



Siemens SGE-42HM (HGM420) generator set.

Not surprisingly, this Sokolow high-efficiency co-generation plant, fully equipped with Siemens Energy gas engines, is one of the most environmentally friendly and technologically advanced power plants in the European food industry.

Benefits

- Co-generation is the most efficient way to generate power, achieving efficiencies that exceed 90 percent, and offering significant energy savings when compared to the supply of electricity and heat or steam from conventional power stations and boilers.
- CHP is a proven technology that reduces harmful emissions (like CO₂) into the environment; past similar applications have achieved 15 – 40 percent reductions in carbon emissions.
- Significant cost savings provide additional competitiveness for industrial users like Sokolow.

Published by

Siemens Energy Global GmbH & Co. KG
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